Social Progress Index: San Jose Methodological Note

The Social Progress Index: San Jose is calculated using a similar methodology as the recently published 2019 Social Progress Index, adapted to the particular context of the City of San Jose. We worked closely with city partners and stakeholders across sectors to collaboratively identify relevant data and assess its relevance and qualifications for the index's criteria. For information about the conceptual underpinning and design principles of the Social Progress Index, please see the 2019 Social Progress Index Methodology Report.

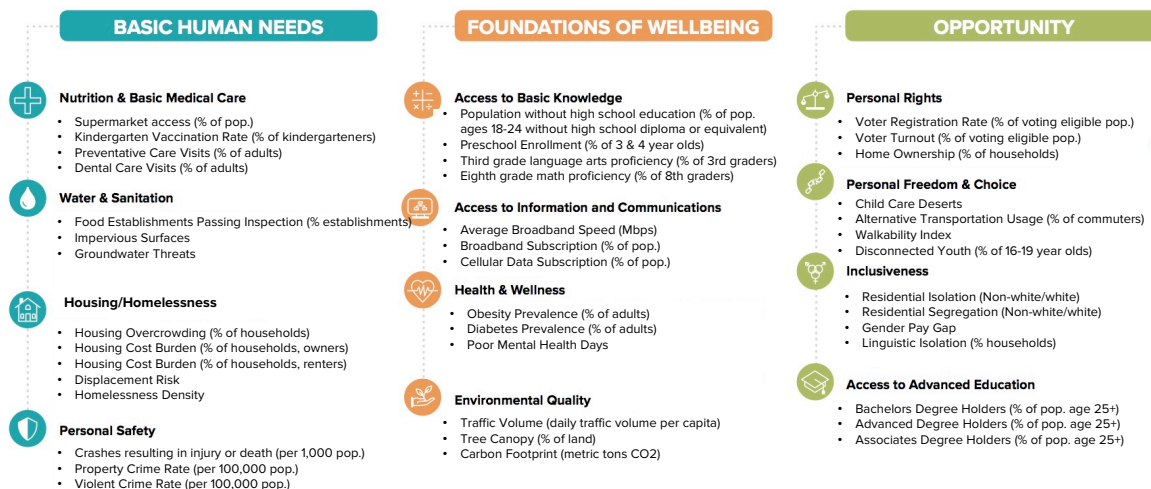There are 42 indicators that comprise the 12 components, listed in Figure 1 below.

Figure 1 **Social Progress Index: San Jose Framework and Indicators**

Prior to aggregation and index calculation, indicators are winsorized to replace gross outliers such that all values above the 99th percentile are replaced with the 99th percentile and all values below the 1st percentile are replaced with the 1st percentile.

The calibration of the Social Progress Index: San Jose occurs at the indicator level, prior to aggregation to component, dimension, and Social Progress Index scores. Indicators are scaled from zero to 100 using benchmarks, which are defined from theoretical boundaries drawn from indicator definitions or from reasonable limits above and below the maximum and minimum values, respectively. In the absence of a strong theoretical or practical boundary, we set top and bottom benchmarks at 15% above the maximum value and 15% below the minimum value. At this stage regression imputation is applied to impute any missing values in the data using all other indicators without missing values as predictors.

For each indicator, a statistical test for normality is performed and those indicators which fail the test statistically are transformed to a more normal distribution using BoxCox power transformations. This process improves the application of Principal Components Analysis (PCA) in the next step by allowing the indicators to follow distributions that can be described by their mean and variance alone, a key assumption for valid PCA.

Within each of the twelve components, we then standardize the indicators and apply PCA to uncover any number less than or equal to the number of indicators of underlying, uncorrelated factors that describe the variance in the indicators. These factors are then reduced to a single component score by weighting each factor based on the percentage of total variance in the data it explains. Dimensions are calculated as the geometric average of the four components that comprise them, and the Social Progress Index score is the geometric average of the three dimensions.

The Social Progress Index: San Jose represents an important new application of the Social Progress Index framework and methodology to capture progress within a major US city. We are always striving to refine our approach and improve our indexes and welcome all feedback.

We thank our supporters and partners who helped make this collaboration possible, including: The City of San Jose, Microsoft, Skoll Foundation, and the Silicon Valley Community Foundation.

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